Miltenyi Biotec

T Cell TransAct™

Efficient T cell activation and expansion

Your new solution for T cell activation

What is T Cell TransAct™?

This ready-to-use reagent provides an innovative method for physiological activation and expansion of human T cells.

T Cell TransAct is a colloidal polymeric nanomatrix conjugated to humanized recombinant CD3 and CD28 agonists ensuring successful activation of resting T cells from hematological cell populations (e.g. PBMCs or enriched T cell populations) without the involvement of CD4 or CD8.

MACS® GMP T Cell TransAct is manufactured and controlled under ISO 13485 requirements. It is designed following the recommendations of USP <1043> on ancillary materials. In the US, a master file is held with the FDA for IND applications with Product Quality Certificate available via our website.

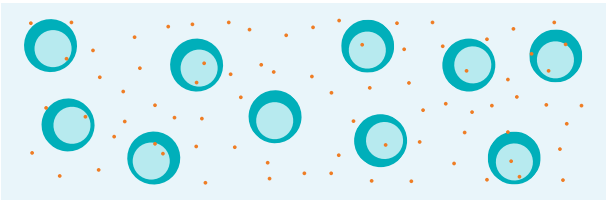

Figure 1: T Cell TransAct is in suspension when added to cell culture for polyclonal T cell stimulation.

T cell activation made simple and convenient

Practical application

- Volumetric dosage
- Ready-to-use
- Removal by simple washing

Robust stimulation

- Highest cell viability
- Physiological and stable stimulation

GMP

Convenient compatibility

- Available for research and GMP T cell workflows
- Optimized for CAR T cell production on the CliniMACS Prodigy®
- Can be sterile filtered


CliniMACS Prodigy®

Efficient T cell activation and expansion

Effective stimulation

T Cell TransAct™ enables optimal T cell activation with a polymeric nanomatrix. The activation efficiency is comparable to larger activation beads. T cell activation made simple and convenient.

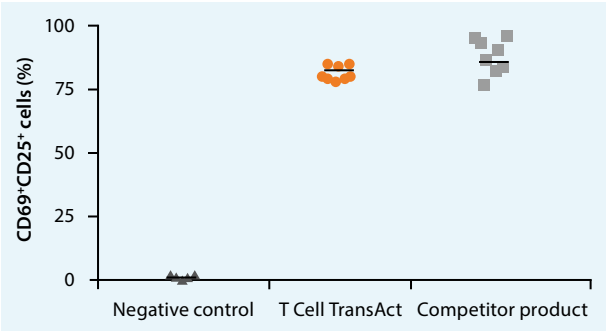

Figure 2: Comparison of activation efficiency at day two between T Cell TransAct and competitor product according to the activation markers CD69 and CD25. After two days, T Cell TransAct-activated cells are comparable to bead-activated cells.

Excellent proliferation

Proliferation of T cells is observed after stimulation with T Cell TransAct. Equal amounts of proliferation are observed when compared to bead-based stimulation methods.

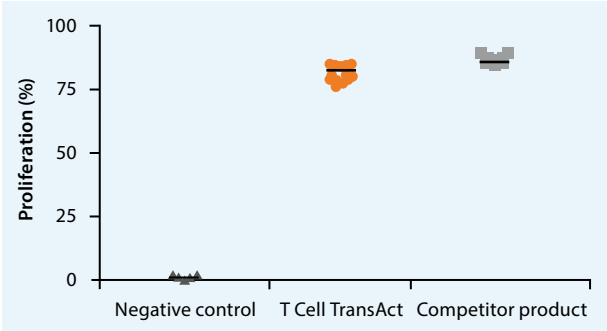

Figure 4: After seven days, proliferation of T Cell TransAct-activated cells is equal to bead-activated cells. T cells were cultivated in TexMACS™ Medium supplemented with IL-7 and IL-15.

High expansion

When striving for robust and reliable T cell proliferation, T Cell TransAct enables serum-free T Cell cultivation while maintaining consistently high cell expansion.

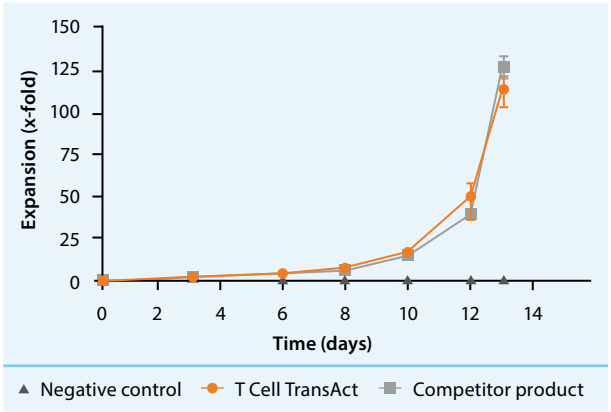

Figure 3: Comparable results of T cell expansion after stimulation with T Cell TransAct or competitor product in TexMACS Medium without human AB serum supplementation.

T cell phenotype

Generating CAR T cells requires a stable T cell phenotype. T cells activated with T cell TransAct and subsequently expanded with IL-7 and IL-15, display a phenotype of early differentiated T cells.

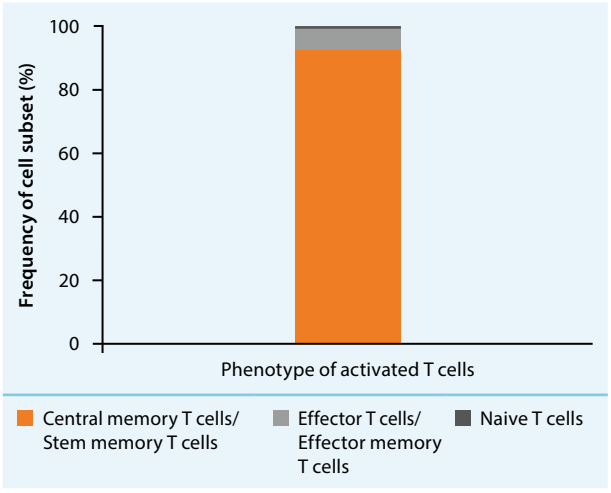

Figure 5: T cells were activated with T Cell TransAct and expanded for 14 days in TexMACS Medium supplemented with IL-7 and IL-15. More than 85% were stem memory T cells and central memory T cells.

Setting the stage for automated production of engineered T cells

Optimal design for CliniMACS Prodigy®

MACS® GMP T Cell TransAct™ is tailor made for the CliniMACS Prodigy.

- Maximum activation capacity for up to 1×10^8 cells
- 1 vial of MACS GMP T Cell TransAct per T cell transduction (TCT) production run

MACS GMP T Cell TransAct allows potent polyclonal T cell activation prior gene modification without the need for feeder cells.

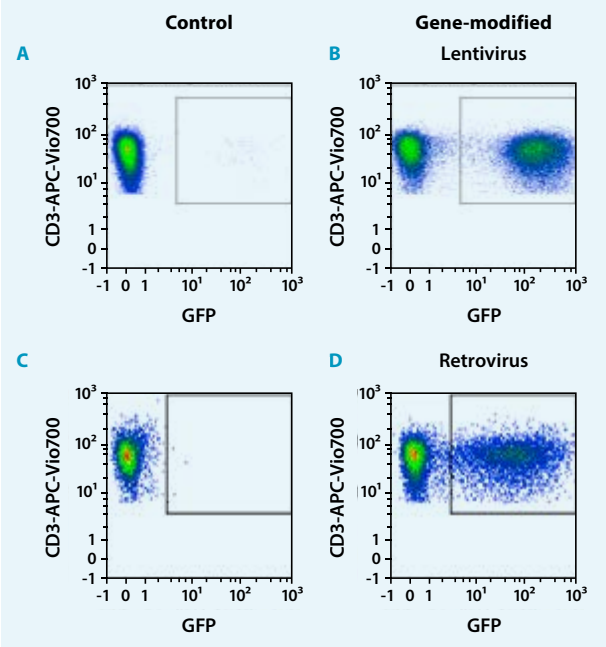

Figure 6: Isolated T cells were activated with MACS GMP T Cell TransAct and transduced with lentivirus (B) or retrovirus (D). Transduction of T cells with GFP vector resulted in strong GFP expression eleven days after gene modification (B, D). Untransduced T cells show no expression of GFP (A, C).

Cell expansion in serum-free media

Clinical-scale expansion of transduced T cells is effective under cultivation conditions with or without human AB serum (fig. 7A and B). The synergy between MACS GMP T Cell TransAct, TexMACS™ Medium and our MACS GMP Cytokines delivers an optimal final engineerd cell product independent of serum addition (fig. 7C).

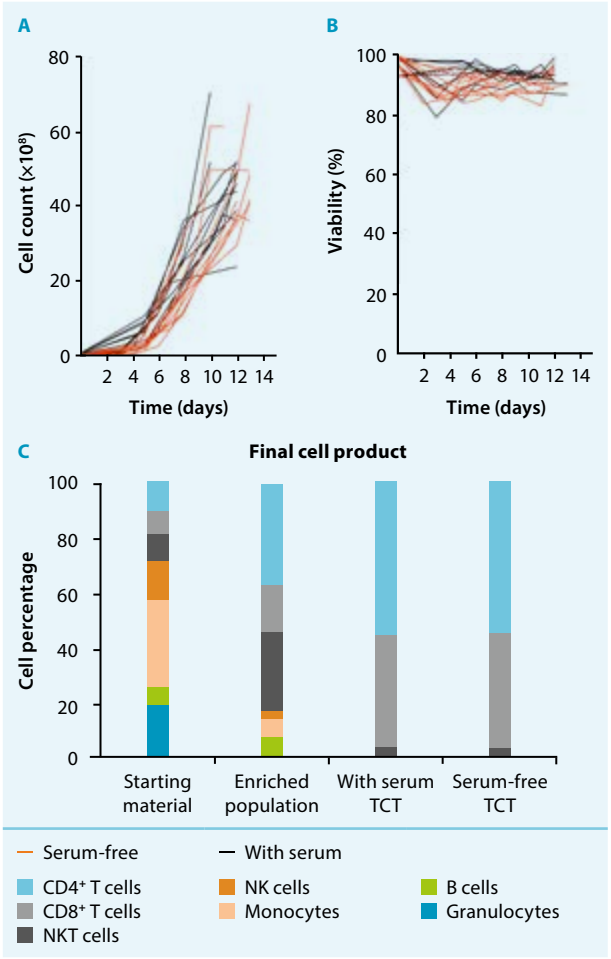

Figure 7: Enriched CD4⁺ and CD8⁺ T cells were stimulated with MACS GMP T Cell TransAct and expanded in a TCT process with 3% human AB serum or serum-free. Cell count (A) and viability (B) of cultured cells were measured at different time points. Cellular composition was determined in starting material, enriched population and in the final expanded product (C).

MACS® GMP T Cell TransAct™- Large Scale

Scale-up your T cell expansion

MACS GMP T Cell TransAct - Large Scale is optimized for the activation of high cell numbers. It is tailor-made for the application on the CliniMACS Prodigy® in combination with the tubing set including the large cultivation chamber.

- Efficient T cell activation and expansion for high cell numbers
- Optimized to activate and expand up to 4×10^8 enriched T cells
- One vial of MACS GMP T Cell TransAct - Large Scale is sufficient for one T cell transduction large-scale production run

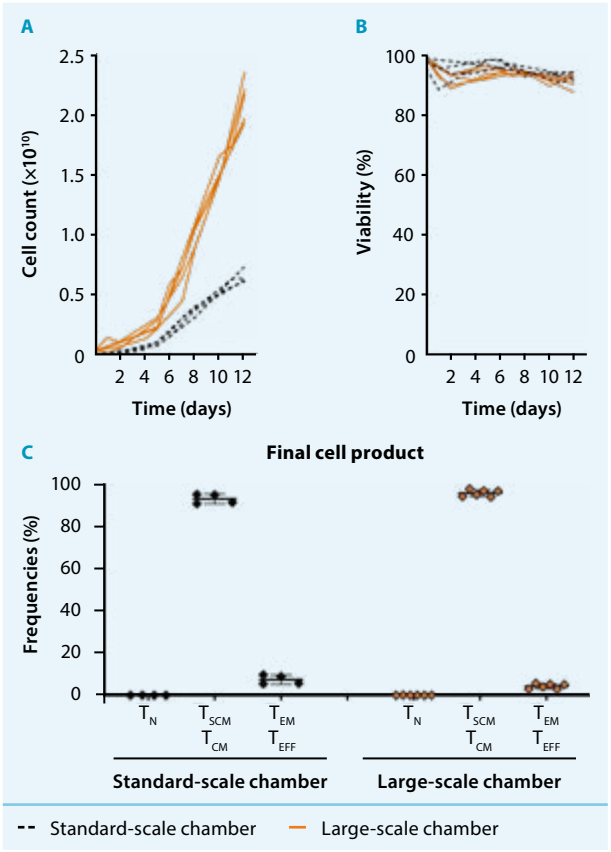

Figure 8: Enriched $CD4^+/CD8^+$ T cells were automatically expanded on the CliniMACS Prodigy after polyclonal stimulation with MACS GMP T Cell TransAct, standard or Large Scale. Either the standard-scale chamber (black, n=4) or the large-scale chamber (orange, n=6) was used for culture. Cell cultivation was monitored at different time points to determine cell number (A) and viability (B). On average, a total cell number of 2.1×10^{10} cells was reached using the large-scale chamber and MACS GMP T Cell TransAct - Large Scale in comparison to 6.5×10^9 cells expanded in the standard-scale chamber. The cellular composition of the enriched fraction was analyzed by flow cytometry on the MACSQuant® Analyzer 10. Frequencies of T cell phenotypes among viable $CD45^+$ cells were determined for the final cell product (C).

Translational solutions for T cell activation

Research

Clinical

ACTIVATION

T Cell TransAct™

- Easy-to-use
- Robust T cell activation
- Colloidal polymeric nanomatrix

MACS® GMP T Cell TransAct

- GMP-grade
- Compatible with the CliniMACS Prodigy®
- Can be sterile filtered

STIMULATION

MACS Cytokines

- High grade quality
- Reliable, high biological activity
- Flexible: customized fillings

MACS GMP Cytokines

- Superior cytokine purity
- High specific activity
- Free of animal- and human-derived materials

EXPANSION

TexMACS™ Medium

- Serum-free T cell medium
- Specifically designed for T cell expansion
- Excellent quality

MACS GMP TexMACS

- Ideal for GMP-compliant T cell expansion
- Serum- and xeno-component free
- Available with or without phenol red

VIDEO

See the CliniMACS Prodigy Process in action!

Generate gene-modified T cells in a simple and automated fashion. Easy to use, this unique process will surely change the way you work.

▸ **miltenyibiotec.com/tct**

▸ miltenyibiotec.com

Miltenyi Biotec

Germany/Austria
Miltenyi Biotec B.V. & Co. KG
Friedrich-Ebert-Straße 68
51429 Bergisch Gladbach
Germany
Phone +49 2204 8306-0
Fax +49 2204 85197
macsde@miltenyi.com

USA/Canada
Miltenyi Biotec Inc.
2303 Lindbergh Street
Auburn, CA 95602, USA
Phone 800 FOR MACS
Phone +1 530 888 8871
Fax +1 877 591 1060
macsus@miltenyi.com

Australia
Miltenyi Biotec
Australia Pty. Ltd.
Unit 11, 2 Eden Park Drive
Macquarie Park, NSW 2113
Australia
Phone +61 2 8877 7400
Fax +61 2 9889 5044
macsau@miltenyi.com

Benelux
Miltenyi Biotec B.V.
Sandifortdreef 17
2333 ZZ Leiden
The Netherlands
macsnl@miltenyi.com
Customer service
The Netherlands
Phone 0800 4020120
Fax 0800 4020100
Customer service Belgium
Phone 0800 94016
Fax 0800 99626
Customer service Luxembourg
Phone 800 24971
Fax 800 24984

China
Miltenyi Biotec Technology &
Trading (Shanghai) Co., Ltd.
Room 401
No. 1077, Zhangheng Road
Pudong New Area
201203 Shanghai, P.R. China
Phone +86 21 6235 1005
Fax +86 21 6235 0953
macscn@miltenyi.com

France
Miltenyi Biotec SAS
10 rue Mercoeur
75011 Paris, France
Phone +33 1 56 98 16 16
Fax +33 1 56 98 16 17
macsfr@miltenyi.com

Italy
Miltenyi Biotec S.r.l.
Via Paolo Nanni Costa, 30
40133 Bologna
Italy
Phone +39 051 6 460 411
Fax +39 051 6 460 499
macsit@miltenyi.com

Japan
Miltenyi Biotec K.K.
NEX-Eitai Building 5F
16-10 Fuyuki, Koto-ku
Tokyo 135-0041, Japan
Phone +81 3 5646 8910
Fax +81 3 5646 8911
macsjp@miltenyi.com

Nordics and Baltics
Miltenyi Biotec Norden AB
Medicon Village
Scheeletorget 1
223 81 Lund
Sweden
macsse@miltenyi.com
Customer service Sweden
Phone 0200 111 800
Customer service Denmark
Phone 80 20 30 10
Customer service
Norway, Finland, Iceland,
and Baltic countries
Phone +46 46 280 72 80

Singapore
Miltenyi Biotec Asia Pacific Pte Ltd
438B Alexandra Road, Block B
Alexandra Technopark
#06-01
Singapore 119968
Phone +65 6238 8183
Fax +65 6238 0302
macssg@miltenyi.com

South Korea
Miltenyi Biotec Korea Co., Ltd.
Arigi Bldg. 8F
562 Nonhyeon-ro
Gangnam-gu
Seoul 06136, South Korea
Phone +82 2 555 1988
Fax +82 2 555 8890
macskr@miltenyi.com

Spain
Miltenyi Biotec S.L.
C/Luis Buñuel 2
Ciudad de la Imagen
28223 Pozuelo de Alarcón (Madrid)
Spain
Phone +34 91 512 12 90
Fax +34 91 512 12 91
macses@miltenyi.com

Switzerland
Miltenyi Biotec Swiss AG
Gibelinstrasse 27
4500 Solothurn
Switzerland
Phone +41 32 623 08 47
Fax +49 2204 85197
macsch@miltenyi.com

United Kingdom
Miltenyi Biotec Ltd.
Almac House, Church Lane
Bisley, Surrey GU24 9DR, UK
Phone +44 1483 799 800
Fax +44 1483 799 811
macsuk@miltenyi.com

www.miltenyibiotec.com

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